expressed by a hypothetical test. Assume any healthy organic cell or organism to be instantaneously resolved into its constitutent particles so that they are suddenly reduced to inorganic substances. Then assume that it were possible to instantaneously reassemble each of these particles in precisely the physical relations in which they before stood to each other with the same temperature conditions and let each particle be instantaneously impressed with motions the same in direction and amount which they possessed at the instant of dissolution. If then the reassembled body goes on as an organism as before, it will be proof that life is but the operation of what are known as the ordinary mechanical and chemical forces. If not, it will be proof that a certain tertium quid no matter what is lacking to convert the body into an organism. This tertium quid constitutes the element of vitalism as it is generally understood. It does not necessarily imply the imposition of some new and foreign principle or substance on the materials constituting the body. It may be nothing more than the bringing into activity of forces or affections previously latent in the materials themselves. The former seems to be the theory of the extreme vitalists who look on the soul as something distinct from the body, while the latter seems to correspond with the views of those vitalists who regard matter as in the language of Tyndal impressed with the potency of all life.

In a last analysis, however, no sharp line of distinction can be drawn between the vitalists of the latter type and the non-vitalists. For it seems clear that if this tertium quid be in any manner latent in the inorganic particles, it may be looked on as undisclosed chemical attributes of the matter itself. It becomes rather a question of definition, what are chemical or mechanical attributes? These terms in their popular significance are confined to forces subject to comparatively simple mathematical laws. I think few mathematicians would concede that such laws, however numerous, could furnish an equation which would satisfy the complicated movements involved in the life history of an organism. The forces at work must be something more than those ordinarily understood as mechanical or chemical.

When to this is added the element of self-direction or self-selection, which in its higher forms assumes the aspect of self-consciousness, we have crossed a barrier which apparently can never be bridged in terms of mechanical or chemical forces and which must seemingly forever remain a mystery, whose solution we are no nearer than were the old Greek philosophers. The weight of such evidence as we have seems to favor a modified vitalist or it might be called mechanical vitalistic view. All vital activity is measurable in terms of energy expended. An infinite chain of physical causation determines every vital movement. No power of self-determination beyond such causation could exist without the power to create energy. The activity of the organic mechanism may be suspended indefinitely and again revived if no disarrangement of its constituent particles occur. On the other hand, no mathematical laws can be conceived of which could express the operation of the forces which direct the life history of the individual. Are we not brought back to the old theistic or deistic conception of an inscrutable power pervading all nature in whom we live and move and have our being?

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A PLEA FOR THE USE OF REFERENCES, AND ACCURACY THEREIN

To the Editor of Science: It has been the writer's duty, during the past two or three years, to compile, or to assist in the compiling of, a number of extensive bibliographies and lists of references to the literature of various chemical subjects, and during this work it has been often impressed upon him with what laxity and apparent disregard of consequences some authors handled—or failed to handle—their references to prior work. The same difficulty is all too often experienced when looking up some apparently simple subject.

For instance, an article was recently desired by a chemist employed in certain synthetic

work, describing a method for the reduction of certain compounds, referred to in a scientific paper, without further information, as "Ladenburg's" method. Persistent search of the indices of the journals where the paper would most probably have appeared yielded only a brief polemic note, *which made no reference to the appearance of the original paper!* The proper method was finally found as a side-issue in a paper on oximes, through the use of a very recent hand-book of laboratory methods, the author of which had very probably gone through the publications of Ladenburg until he struck this article. Had the author of the paper from which the reference (?) mentioned in the first sentence of this paragraph taken half a minute's more time and given this reference, and given it correctly, he would have saved others literally hours of searching.

Another instance. Certain important and excellent work was recently done in Philadelphia on methods of sewage disposal. As one feature of this work, a large number of determinations of the amounts of nitrates present were made by what was referred to as "McRae's narcotine test," no reference or description of the method being given. It became necessary elsewhere to find the details of this method, and it so happened that the usual chemical abstract journals had missed this paper. As a last resort, the "Index Medicus" was looked through, and finally a reference to the paper was found, though even here the citation given was not the one where the paper would usually be most easily found. Had the author of the report of the Philadelphia experiments given a half-line reference to the place of publication of this method, he would have saved an hour or more of the time of one or two men in a busy laboratory.

Fortunately, cases of the total omission of an important reference are comparatively rare, though the embarrassment and additional work such omissions cause is quite sufficient to warrant their being judiciously guarded against. More frequent, and sometimes equally troublesome, are the cases where erroneous page, volume or year numbers are given, or sometimes even an erroneous journal or book name. A case recently shown me was that of an author who referred some eight or nine times in a paper of four pages, to the work of another author "Schreiber";—"Schreiber's" correct name was "Fleischer"!

The movement for the unification and coordination of zoologic nomenclature, although differing in many considerable respects from what a similar movement in other sciences would be, includes not a few phases which could well be studied and adopted by non-zoologic contributors to the literature of science.

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A TREMATODE EPIDEMIC AMONG ENGLISH SPARROWS

DURING the months of June and July, 1910, English sparrows in the vicinity of the College of Agriculture of the University of Wisconsin at Madison were found to be very commonly infected with a trematode parasite which was identified as *Monostoma faba* Bremser. This parasite, which forms conspicuous cysts in the skin of the abdominal region, has long been known in Europe, but has heretofore been reported in only one or two isolated cases on this continent. Attention is called to the matter here, as it may be of general interest to helminthologists, and in order that others may be on the lookout for the parasite in this country. In this locality the parasite appeared to cause a certain mortality, and it is possible that it may become one of the means which will help to check the increase of the English sparrow in North America. Unfortunately, it attacks other small passerine birds of several families as well. A more detailed account of the present epidemic is being published in the *Bulletin of the Wisconsin Natural History Society*, Vol. 9, Nos. 1–2, pp. 42–48, pl. 5, April, 1911.

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MADISON, WIS.,
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